



# SEQUENCE LISTING

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<120> METHOD FOR PRODUCING ALCOHOL BY USING MICROORGANISM

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<150> JP 2001-270903

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<170> PatentIn Ver. 2.0

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Phe Lys Asn Asn Arg Thr Lys Tyr Ala Thr Lys Tyr Lys Met Ala Asn						
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Glu Thr Lys Glu Gln Phe Lys Leu Ile Ala Lys Glu Tyr Ala Arg Met						
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Thr Arg Leu Asn Ala Gly Val Arg Val His Pro Lys Trp Asn Glu Thr						
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gcc gct acc ggg atg ctg tgg gat tcc gcc cag gcg gcg gaa cag aag	1879					
Ala Ala Thr Gly Met Leu Trp Asp Ser Ala Gln Ala Ala Glu Gln Lys						
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Asn Gly Tyr Leu Ala Gln Val Leu Asp Glu Ile Arg His Thr His Gln						
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tgt gcc tac gtc aac tac tac ttc gcg aag aac ggc cag gac ccg gcc	1975					
Cys Ala Tyr Val Asn Tyr Tyr Phe Ala Lys Asn Gly Gln Asp Pro Ala						
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Gly His Asn Asp Ala Arg Arg Thr Arg Thr Ile Gly Pro Leu Trp Lys						
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ggc atg aag cgc gtg ttt tcc gac ggc ttc att tcc ggc gac gcc gtg	2071					
Gly Met Lys Arg Val Phe Ser Asp Gly Phe Ile Ser Gly Asp Ala Val						
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Pro Leu Ile Val Ala Val Thr Glu Trp Ala Ala Ala Asn Gly Asp Glu						
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atc acc ccg acg gtg ttc ctg tcg atc gag acc gac gaa ctg cgc cac	2215					
Ile Thr Pro Thr Val Phe Leu Ser Ile Glu Thr Asp Glu Leu Arg His						
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atg gcc aac ggt tac cag acc gtc gtt tcc atc gcc aac gat ccg gct	2263					
Met Ala Asn Gly Tyr Gln Thr Val Val Ser Ile Ala Asn Asp Pro Ala						
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tcc gcc aag tat ctc aac acg gac ctg aac aac gcc ttc tgg acc cag	2311					
Ser Ala Lys Tyr Leu Asn Thr Asp Leu Asn Asn Ala Phe Trp Thr Gln						
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Lys Phe Lys Val Glu Pro Trp Val Lys Thr Trp Asp Arg Trp Val Tyr			
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Glu Asp Trp Gly Gly Ile Trp Ile Gly Arg Leu Gly Lys Tyr Gly Val			
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gag tcg ccg cgc agc ctc aag gac gcc aag cag gac gct tac tgg gct			2503
Glu Ser Pro Arg Ser Leu Lys Asp Ala Lys Gln Asp Ala Tyr Trp Ala			
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His His Asp Leu Tyr Leu Leu Ala Tyr Ala Leu Trp Pro Thr Gly Phe			
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Phe Arg Leu Ala Leu Pro Asp Gln Glu Glu Met Glu Trp Phe Glu Ala			
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aac tac ccc ggc tgg tac gac cac tac ggc aag atc tac gag gaa tgg			2647
Asn Tyr Pro Gly Trp Tyr Asp His Tyr Gly Lys Ile Tyr Glu Glu Trp			
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cgc gcc cgc ggt tgc gag gat ccg tcc tcg ggc ttc atc ccg ctg atg			2695
Arg Ala Arg Gly Cys Glu Asp Pro Ser Ser Gly Phe Ile Pro Leu Met			
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Trp Phe Ile Glu Asn Asn His Pro Ile Tyr Ile Asp Arg Val Ser Gln			
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Val Pro Phe Cys Pro Ser Leu Ala Lys Gly Ala Ser Thr Leu Arg Val			
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cac gag tac aac ggc gag atg cac acc ttc agc gac cag tgg ggc gag			2839
His Glu Tyr Asn Gly Glu Met His Thr Phe Ser Asp Gln Trp Gly Glu			
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Arg Met Trp Leu Ala Glu Pro Glu Arg Tyr Glu Cys Gln Asn Ile Phe			
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Gly Leu Arg Ser Asp Gly Lys Thr Leu Ile Ala Gln Pro His Val Arg			
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Phe Lys Asn Pro Val Lys Ala Phe Asn			
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Met Ser Met Leu Gly Glu Arg Arg Arg Gly Leu Thr Asp Pro Glu Met			
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tat gaa gcc ctg acc gtt tat gcg cag ccc aac gcc gac tgg atc gcc			3333

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Lys	His	Arg	Asp	Pro	Leu	Arg	Arg	Trp	His	Ala	Pro	Tyr	Val	Lys	Asp		
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Lys	Ala	Glu	Glu	Trp	Arg	Tyr	Thr	Asp	Arg	Phe	Leu	Gln	Gly	Tyr	Ser		
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Lys	Leu	Glu	Asp	Tyr	His	Ala				Met	Ala	Lys	Leu	Gly			
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Ile	His	Ser	Asn	Asp	Thr	Arg	Asp	Ala	Trp	Val	Asn	Lys	Ile	Ala	Gln		
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Leu	Trp	Ile	Glu	Ala	Lys	Leu	Glu	Glu	Lys	Val	Ala	Val	Leu	Lys	Ala		
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Arg	Ala	Phe	Asn	Glu	Val	Asp	Phe	Arg	His	Lys	Thr	Ala	Phe	Gly	Glu		
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Asp	Ala	Lys	Ser	Val	Leu	Asp	Gly	Thr	Val	Ala	Lys	Met	Asn	Ala	Ala		
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Lys	Asp	Lys	Trp	Glu	Ala	Glu	Lys	Ile	His	Ile	Gly	Phe	Arg	Gln	Ala		
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tac	aag	ccg	ccg	atc	atg	ccg	gtg	aac	tat	ttc	ctg	gac	ggc	gag	cgt	5162	

Tyr Lys Pro Pro Ile Met Pro Val Asn Tyr Phe Leu Asp Gly Glu Arg  
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 Gln Leu Gly Thr Arg Leu Met Glu Leu Arg Asn Leu Asn Tyr Tyr Asp  
 135 140 145  
 acg ccg ctg gaa gaa ctg cgc aaa cag cgc ggt gtg cgg gtg gtg cat 5258  
 Thr Pro Leu Glu Glu Leu Arg Lys Gln Arg Gly Val Arg Val Val His  
 150 155 160 165  
 ctg cag tcg ccg cac tga agggaggaag tctcgcctg gacgcgacgg 5306  
 Leu Gln Ser Pro His  
 170  
 catcgccgtg aagtcaggg ggcagggatg ccgttcggg ccggcaggct ggcccggaaat 5366  
 ctctggtttt cagggggcgt gccgtccac ggctccccc ctccatcttt cgtaaggaaa 5426  
 tcacc atg gtc gaa tcg gca ttt cag cca ttt tcg ggc gac gca gac gaa 5476  
 Met Val Glu Ser Ala Phe Gln Pro Phe Ser Gly Asp Ala Asp Glu  
 1 5 10 15  
 tgg ttc gag gaa cca cgg ccc cag gcc ggt ttc ttc cct tcc gcg gac 5524  
 Trp Phe Glu Glu Pro Arg Pro Gln Ala Gly Phe Phe Pro Ser Ala Asp  
 20 25 30  
 tgg cat ctg ctc aaa cgg gac gag acc tac gca gcc tat gcc aag gat 5572  
 Trp His Leu Leu Lys Arg Asp Glu Thr Tyr Ala Ala Tyr Ala Lys Asp  
 35 40 45  
 ctc gat ttc atg tgg cgg tgg gtc atc gtc cgg gaa gaa agg atc gtc 5620  
 Leu Asp Phe Met Trp Arg Trp Val Ile Val Arg Glu Glu Arg Ile Val  
 50 55 60  
 cag gag ggt tgc tcg atc agc ctg gag tcg tcg atc cgc gcc gtg acg 5668  
 Gln Glu Gly Cys Ser Ile Ser Leu Glu Ser Ser Ile Arg Ala Val Thr  
 65 70 75  
 cac gta ctg aat tat ttt ggt atg acc gaa caa cgc gcc ccg gca gag 5716  
 His Val Leu Asn Tyr Phe Gly Met Thr Glu Gln Arg Ala Pro Ala Glu  
 80 85 90 95  
 gac cgg acc ggc gga gtt caa cat tga acaggtaagt tt atg cag cga gtt 5767  
 Asp Arg Thr Gly Val Gln His Met Gln Arg Val  
 100 1  
 cac act atc acg gcg gtg acg gag gat ggc gaa tcg ctc cgc ttc gaa 5815  
 His Thr Ile Thr Ala Val Thr Glu Asp Gly Glu Ser Leu Arg Phe Glu  
 5 10 15 20  
 tgc cgt tcg gac gag gac gtc atc acc gcc gcc ctg cgc cag aac atc 5863  
 Cys Arg Ser Asp Glu Asp Val Ile Thr Ala Ala Leu Arg Gln Asn Ile  
 25 30 35  
 ttt ctg atg tcg tcc tgc cgg gag ggc ggc tgt gcg acc tgc aag gcc 5911  
 Phe Leu Met Ser Ser Cys Arg Glu Gly Gly Cys Ala Thr Cys Lys Ala  
 40 45 50  
 ttg tgc agc gaa ggg gac tac gac ctc aag ggc tgc agc gtt cag gcg 5959  
 Leu Cys Ser Glu Gly Asp Tyr Asp Leu Lys Gly Cys Ser Val Gln Ala  
 55 60 65  
 ctg ccg ccg gaa gag gag gag gaa ggg ttg gtg ttg ttg tgc cgg acc 6007  
 Leu Pro Pro Glu Glu Glu Glu Glu Gly Leu Val Leu Leu Cys Arg Thr  
 70 75 80  
 tac ccg aag acc gac ctg gaa atc gaa ctg ccc tat acc cat tgc cgc 6055  
 Tyr Pro Lys Thr Asp Leu Glu Ile Glu Leu Pro Tyr Thr His Cys Arg  
 85 90 95 100  
 atc agt ttt ggt gag gtc ggc agt ttc gag gcg gag gtc gtc ggc ctc 6103  
 Ile Ser Phe Gly Glu Val Gly Ser Phe Glu Ala Glu Val Val Gly Leu  
 105 110 115  
 aac tgg gtt tcg agc aac acc gtc cag ttt ctt ttg cag aag cgg ccc 6151  
 Asn Trp Val Ser Ser Asn Thr Val Gln Phe Leu Leu Gln Lys Arg Pro

	120		125		130	
gac gag tgc ggc aac cgt ggc-gtg aaa ttc gaa ccc ggt cag ttc atg						6199
Asp Glu Cys Gly Asn Arg Gly Val Lys Phe Glu Pro Gly Gln Phe Met						
	135		140		145	
gac ctg acc atc ccc ggc acc gat gtc tcc cgc tcc tac tcg ccg gcg						6247
Asp Leu Thr Ile Pro Gly Thr Asp Val Ser Arg Ser Tyr Ser Pro Ala						
	150		155		160	
aac ctt cct aat ccc gaa ggc cgc ctg gag ttc ctg atc cgc gtg tta						6295
Asn Leu Pro Asn Pro Glu Gly Arg Leu Glu Phe Leu Ile Arg Val Leu						
	165		170		175	
ccg gag gga cgg ttt tcg gac tac ctg cgc aat gac gcg cgt gtc gga						6343
Pro Glu Gly Arg Phe Ser Asp Tyr Leu Arg Asn Asp Ala Arg Val Gly						
	185		190		195	
cag gtc ctc tcg gtc aaa ggg cca ctg ggc gtg ttc ggt ctc aag gag						6391
Gln Val Leu Ser Val Lys Gly Pro Leu Gly Val Phe Gly Leu Lys Glu						
	200		205		210	
cgg ggc atg gcg ccg cgc tat ttc gtg gcc ggc ggc acc ggg ttg gcg						6439
Arg Gly Met Ala Pro Arg Tyr Phe Val Ala Gly Gly Thr Gly Leu Ala						
	215		220		225	
ccg gtg gtc tcg atg gtg cgg cag atg cag gag tgg acc gcg ccg aac						6487
Pro Val Val Ser Met Val Arg Gln Met Gln Glu Trp Thr Ala Pro Asn						
	230		235		240	
gag acc cgc atc tat ttc ggt gtg aac acc gag ccg gaa ttg ttc tac						6535
Glu Thr Arg Ile Tyr Phe Gly Val Asn Thr Glu Pro Glu Leu Phe Tyr						
	245		250		255	260
atc gac gag ctc aaa tcc ctg gaa cga tcg atg cgc aat ctc acc gtg						6583
Ile Asp Glu Leu Lys Ser Leu Glu Arg Ser Met Arg Asn Leu Thr Val						
	265		270		275	
aag gcc tgt gtc tgg cac ccg agc ggg gac tgg gaa ggc gag cag ggc						6631
Lys Ala Cys Val Trp His Pro Ser Gly Asp Trp Glu Gly Glu Gln Gly						
	280		285		290	
tcg ccc atc gat gcg ttg cgg gaa gac ctg gag tcc tcc gac gcc aac						6679
Ser Pro Ile Asp Ala Leu Arg Glu Asp Leu Glu Ser Ser Asp Ala Asn						
	295		300		305	
ccg gac att tat ttg tgc ggt ccg ccg ggc atg atc gat gcc gcc tgc						6727
Pro Asp Ile Tyr Leu Cys Gly Pro Pro Gly Met Ile Asp Ala Ala Cys						
	310		315		320	
gag ctg gta cgc agc cgc ggt atc ccc ggc gaa cag gtc ttc ttc gaa						6775
Glu Leu Val Arg Ser Arg Gly Ile Pro Gly Glu Gln Val Phe Phe Glu						
	325		330		335	340
aaa ttc ctg ccg tcc ggg gcg gcc tga accggggaag taccgtgacc						6822
Lys Phe Leu Pro Ser Gly Ala Ala						
	345					
accgagcagt tcccgcacca attcctgcgt gaaatgatcg agcagctgga cgccagcatc						6882
caggagctcg cacgcaagga aaagggactt gcggcatccc tgggcacggg ccgggtcgcc						6942
gagctcaagg aatactggga ccacgttctc actcccagg aggaatggga gctcaagcga						7002
ccatggactt ccgcgaccgg gaactggtgt ggatctggtc ccgtctcagg cgggccccgaa						7062
cctcccgcgc caatgccggg gaggcctata tcgccagctg tcgccggcgc cgcgaaaaaa						7122
cgaacaatcc tgaacggag tcgacgggta tcgttgggaa aaaggttatc tgctcgcccta						7182
ttttgt						7188

□